It is important to note that in addition to the information we have provided, there may be additional information available through other federal agencies, such as the Department of the Interior which houses the United States Geological Survey.

Based on your request, the Waste Reduction Model (WARM) tool seems to be especially relevant in answering questions about the comparison of materials based on how the material is managed at the end of its first useful life. The WARM tool models 54 materials and 6 management practices, allowing the user to compare a baseline and alternative scenario. Specifically relevant to your needs, the tool models "source reduction" as a management practice, so you can calculate the estimated environmental benefit of avoiding a material or product. The WARM tool can be found here: https://www.epa.gov/warm. For the most up-to-date calculations in WARM, please use WARM version 14.

Aluminum cans, steel cans and glass are all materials and products that are modeled in WARM. There is extensive documentation available for each material and the associated management practices. The WARM documentation chapters can be found here: https://www.epa.gov/sites/production/files/2016-03/documents/warm_v14_background.pdf. While there are additional details in the documentation chapters, we have included summary tables below that show the estimated metric tons of carbon dioxide equivalent per short ton for aluminum cans and steel cans from page 2-6 and glass from page 1-3 in the documentation on Containers, Packaging and Non-Durable Good Materials Chapters.

Exhibit 2-7: Net Emissions for Metals under Each Materials Management Option ($MTCO_2E$/Short Ton)

Material	Net Source Reduction (Reuse) Emissions For Current Mix of Inputs[a]	Net Recycling Emissions	Net Composting Emissions	Net Combustion Emissions	Net Landfilling Emissions	Net Anaerobic Digestion Emissions
Aluminum Cans	-4.91	-9.11	NA	0.04	0.02	NA
Aluminum Ingot	-7.47	-7.19	NA	0.04	0.02	NA
Steel Cans	-3.06	-1.81	NA	-1.57	0.02	NA
Copper Wire	-7.01	-4.71	NA	0.03	0.02	NA
Mixed Metals	-3.70	-4.34	NA	-1.02	0.02	NA

Note: Negative values denote net GHG emission reductions or carbon storage from a materials management practice.
NA = Not applicable.

Exhibit 1-4: Net Emissions for Glass under Each Materials Management Option ($MTCO_2E$/Short Ton)

Material	Net Source Reduction (Reuse) GHG Emissions For Current Mix of Inputs	Net Recycling GHG Emissions	Net Composting GHG Emissions	Net Combustion GHG Emissions	Net Landfilling GHG Emissions	Net Anaerobic Digestion Emissions
Glass	-0.53	-0.28	NA	0.03	0.02	NA

Note: Negative values denote net GHG emission reductions or carbon storage from a materials management practice.
NA = This materials management option is not applicable to this material.

Within the user's guides developed for the WARM tool, you'll learn about how to model the materials and management practices that are relevant to your situation. Because each user can tailor the model to their needs and each user has a unique situation, it is not appropriate for us to calculate results on your behalf, but we are happy to help you learn about the tool and interpret results. If you have additional questions about the WARM tool, please email ORCRWARMquestions@epa.gov and we'll be happy to respond.